Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) A method for performing an integrated diagnostics of an EMA motoring subsystem using embedded electronic control circuits, the method comprising:

implementing a plurality of operating structures into an EMA motoring subsystem, each operating structure having optimized rates of data sampling and processing ;

determining an operational mode of the EMA motoring subsystem;

selecting one of the implemented plurality of operating structures that corresponds to the determined operational mode;

acquiring multi-channel data using the selected operating structure; and

analyzing the acquired data to identify and classify a fault of the EMA motoring subsystem.

2. (original) A method of variable structure diagnostics system, comprising:

implementing a plurality of operating structures into an EMA motoring subsystem, each operating structure having optimized rates of data sampling and processing ;

determining an operational mode of the EMA motoring subsystem;

selecting one of the implemented plurality of operating structures that corresponds to the determined operational mode;

acquiring multi-channel data using the selected operating

structure; and

analyzing the acquired data to identify and classify a fault of the EMA motoring subsystem.

3. (original) The method of claim 2, wherein the determined preferred operational mode of a low sampling frequency is a pseudo-small-signal mode.

4. (original) The method of claim 2, wherein the determined operational mode is a large signal mode in complementary to the pseudo-small-signal mode.

5. (original) The method of claim 2 identifies the vehicle mission states combining with the estimation of the pseudo-small-signal mode, further reducing the rate of the data sampling and processing.

6. (original) A method for performing integrated diagnostics of an EMA motoring subsystem in a flying vehicle at a low-frequency sampling rate, the method comprising:

determining a mission phase of an operating vehicle;

selecting a pseudo-steady-state operating condition of an EMA motoring subsystem of the operating vehicle based on the determined mission phase;

sampling and processing data at a low-frequency sampling rate optimized for the selected pseudo-steady-state operating condition; and

identifying and classifying a fault of the EMA motoring subsystem based on the processed data.

7. (original) The method of claim 6, wherein the determined mission phase is on-ground, take-off, cruise or landing phase.

8. (original) The method of claim 6, further including the step of:

predicting the fault of the EMA motoring subsystem based on the processed data.

9. (original) The method of claim 6, wherein the operating vehicle is an Unmanned Combat Air Vehicle (UCAV), a shuttle evolved vehicle or new manned space vehicle, a commercial aircraft, a land based autonomous craft, a land based manned craft, a sea based autonomous craft or a sea based manned craft.

10-13. (cancelled)

14. (original) A method for performing integrated diagnostics and prognostics of an EMA motoring subsystem in a vehicle, the method comprising:

monitoring an operational status of an EMA motoring subsystem of a vehicle;

determining an operational mode of the EMA motoring subsystem based on key state variables of the EMA motoring subsystem and a mission phase of the vehicle;

selecting sampling rate optimized for the determined operational mode;

acquiring multi-channel data at the selected sampling rate;

storing the acquired data to a memory through a DMA channel;

analyzing condition of the EMA motoring subsystem using the stored data;

identifying and classifying a fault of the EMA motoring subsystem based on the analyzed condition; and

predicting the fault of the EMA motoring subsystem based on the

analyzed condition.

15. (original) A method of claim 14, wherein the determined operational mode is a pseudo-small-signal mode or a large signal mode.

16. (original) A method of claim 14, wherein the selected sampling rate is an optimum sampling rate for the large signal mode.

17. (original) A method of claim 14, wherein the EMA motoring subsystem is a stator winding, a rotor bar or a bearing system.

18. (original) A method for performing integrated diagnostics and prognostics of an EMA motoring subsystem in a vehicle, the method comprising:

implementing a plurality of operating structures into an EMA motoring subsystem of a vehicle, each operating structure having a data sampling rate;

monitoring an operational status of the EMA motoring subsystem;

determining a flight mission phase of the vehicle;

assessing key state variables of the EMA motoring subsystem;

selecting one of the plurality of operating structures based on assessed key state variables and the determined flight mission phase;

acquiring multi-channel data using the selected operating structure;

storing the acquired data to a memory through a DMA channel;

analyzing condition of the EMA motoring subsystem using the stored data;

identifying and classifying a fault of the EMA motoring subsystem based on the analyzed condition; and

predicting the fault of the EMA motoring subsystem based on the

analyzed condition.

19-32. (cancelled)